to the south), and routine agricultural activities (e.g., use of heavy-duty equipment). Intermittent noise from outdoor activities at the surrounding residences (e.g., people talking, operation of landscaping equipment, car doors slamming, and dogs barking) though minor, also influences the existing noise environment.

As stated above, one of the dominant noise sources in the vicinity of the project site is vehicular traffic on nearby roadways. Traffic on I-5 contributes the highest background noise levels at the project site and vicinity. Existing roadway traffic noise levels were modeled for I-5 using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA-RD-77-108) based on traffic data obtained from the California Department of Transportation (DOT) (DOT2007). The FHWA model is based on CALVENO reference noise factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground attenuation factors. Truck usage and vehicle speeds on study area roadways were estimated from field observations and DOT data where available (DOT 2007).

Table 3-4 presents the modeled Community Noise Equivalent and Day-Night noise levels (CNEL/L_{dn}) at 50 feet from the centerline of the near travel lane and the distance from the roadway centerline to the 55-, 60-, 65-, and 70-dBA (A-weighted decibels) CNEL/ L_{dn} contours for existing average daily traffic (ADT) volumes. Based on the modeling conducted, existing traffic on I-5 would result in noise levels between 45 and 50 dBA CNEL/L_{dn} at approximately 5,000 feet, which is the distance to the residence closest to LM 3.9L from I-5.

The current Noise Element of the Yolo County General Plan contains the following policies (Yolo County 1983):

- N1. *Noise, Basic.* Yolo County shall regulate, educate, and cooperate to reduce excessive noise levels within the environment and particularly those noise levels which impinge upon the home environment.
- N2. *Noise, Land Use.* Yolo County shall regulate the location and operation of land uses to avoid or mitigate harmful or nuisance levels of noise.
- N3. *Noise, Prevent, and Control.* Noise shall be prevented, avoided, and suppressed by controlling noises at the source, providing barriers or buffers, by the implementing a noise ordinance, and implementing wise land use planning that considers noise effects and prevention.

Table 3-4
Summary of Modeled Existing Vehicular Traffic-Noise Levels

Roadway Segment	Distance (ft) from Roadway Centerline to CNEL/L_{dn} (dBA) Contour				CNEL/L_{dn} (dBA) 50 Feet from Centerline of Nearest Travel Lane
	70	65	60	55	
I-5 to the west of LM 3.9L and 4.2L (south of County Road 17 Interchange)	175	377	813	1,751	78.2

Notes: Modeled noise levels do not consider any shielding or reflection of noise by existing structures or terrain features or noise contribution from other sources and where:

- A-weighted Decibel (dBA) is a measure on a logarithmic scale which indicates the squared ratio of sound pressure to a reference sound pressure. A-weighted (A) refers to the specific frequency-dependent rating scale that is used to approximate human response.
- Community Noise Equivalent Level (CNEL) is the energy-average of the A-weighted noise levels during a 24-hour period with 5 dBA added to the evening (7 to 10 p.m.) hours and 10 dBA to the night (10 p.m. to 7 a.m.) hours.
- Day-Night Level (L_{dn}) is the energy-average of the A-weighted noise levels during a 24-hour period with 10 dBA added to the night (10 p.m. to 7 a.m.) hours.

See modeling results in Appendix D for further details.
Source: Data modeled by EDAW in 2008

- N4. *Noise Ordinance.* Yolo County shall adopt a comprehensive Noise Ordinance.

- N5. *Development Review*. Yolo County shall review all new development and redevelopment in terms of the Standards of Noise Avoidance or Control.

- N6. *Basic Compatibility*. Yolo County shall review all new developments, public and private, for noise compatibility with surrounding uses to protect the occupants of nearby lands from undesirable noise levels and discourage new residential development in areas subject to legal, long-term, excessive noise.

- N7. *Development Control/Noise*. Yolo County shall review development plans for noise compatibility of the proposed use with the surrounding uses and planned uses, and shall incorporate noise reduction, avoidance, or mitigation techniques as necessary.

- N8. *Implementation*. Yolo County shall achieve these policies by the application of available review, guidance, and regulatory devices including placing future development within areas of noise compatible land uses; supporting efforts to reduce noise levels; coordination with transportation agencies to reduce noise through design and location of new facilities; and application of design standards to avoid or mitigate noise problems, including structure design, materials, and location.

- N9. *Mitigation and Reduction*. Yolo County shall require mitigation to reduce noise to acceptable levels throughout the County and particularly within home environments. Reductions of noise shall be sought at the source, along its path, and/or at receiver points if such noise is determined to be excessive.

- N10. *County Noise Control*. Yolo County shall develop a program to reduce or control noise generated from sources under the County's jurisdiction.

- N11. *Standards*. Yolo County shall set and enforce measurable standards for noise reduction and control on construction projects, equipment purchase contracts let by the County, and as part of development review of private construction project subject to approval by the County.

- N12. *Noise and Safety/Airports*. Yolo County shall coordinate with other governmental agencies as well as the private sector in efforts to combat, alleviate, or mitigate excessive, hazardous, or annoying noise.

- N13. *Coordination*. Yolo County shall coordinate with other governmental agencies as well as the private sector in efforts to combat, alleviate, or mitigate excessive, hazardous, or annoying noise.

- N14. *Noise Insulation*. Noise insulation standards shall be enforced by the Building Department.

- N15. *Noise/State Highways*. Yolo County shall encourage continuation of the State Roadway Noise Abatement Program(s).

- N16. *Integrate with Other Elements*. The Noise Element shall be integrated with Land Use, Safety, Open Space, Scenic Highways, Circulation, Conservation, and other elements of the General Plan as well as the Energy Plan.

According to Yolo County, a noise ordinance has not been adopted (Yolo County 2008c).

DISCUSSION

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or in other applicable local, State, or federal standards?

Short-Term Construction Source Noise

Less than Significant with Mitigation. Construction activities at LM 3.9L and 4.2L would include site preparation (e.g., excavation, grading, and clearing), material transport, levee construction, road realignment, and other miscellaneous activities. On-site construction equipment would include graders, dozers, and excavators. Noise levels for individual equipment can range from 79 to 101 dBA at 50 feet, as indicated in Table 3-5.

Table 3-5
Typical Construction-Equipment Noise Levels

Type of Equipment	Noise Level in dBA at 50 feet	
	Without Feasible Noise Control	With Feasible Noise Control[1]
Pile Driver	101	95
Dozer or Tractor	80	75
Excavator	88	80
Scraper	88	80
Front-end Loader	79	75
Backhoe	85	75
Grader	85	75
Crane	83	75
Truck	91	75

[1] Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturers' specifications.
Sources: EPA 1971, FTA 2006

The simultaneous operation of on-site construction equipment could result in combined intermittent noise levels up to 88 dBA at 50 feet from the project site. Based on these noise levels and a typical noise-attenuation rate of 6 dBA per doubling of distance, exterior noise levels at noise-sensitive receptors located within 550 feet from the project site (e.g., rural residences, Migrant Headstart Preschool) could exceed 60 dBA without feasible noise controls. Specifically, construction-generated noise levels could reach 80 dBA at the closest rural residence within approximately 100 feet from LM 4.2L. The Migrant Headstart Preschool is approximately 1,200 feet to the east of the project site. Construction-generated noise levels at the facility could reach 52 dBA. However, the facilities manager for the Migrant Headstart Preschool stated that the building is equipped with air conditioning and that windows are closed during the day for proper use of the air conditioning system (Herrara, pers. comm., 2008). Windows and building facades typically reduce interior noise levels by 15 dBA (Lipscomb and Taylor 1978). Thus, inside the school noise levels from project construction would be less than 37 dBA which is within acceptable levels for interior spaces (OPR 2003).

Construction of the project would also result in a short-term increase in traffic on the local area roadway network, but this increase would not be sufficient to increase traffic noise levels. It is expected that up to 95 daily trips (consisting of 52 haul and 43 employee trips) would occur during the maximum construction activity periods.

Construction-related traffic would be distributed over the roadway network identified below. The daily haul truck trips would occur through designated haul routes. Since the added traffic is minimal and on designated haul routes, it would not increase the overall traffic noise levels a significant amount. See "Transportation/Traffic" section for additional information.

In most cases, the local noise ordinance contains standards for residential uses affected by construction source noise. Included in these ordinances are provisions that noise from construction activities that do not occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) are exempt from the provisions of the applicable ordinances. However, as discussed above, Yolo County has not adopted a noise ordinance or any other construction noise standards for which construction-generated noise levels would exceed. Nevertheless, if construction activities were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) or construction equipment was not properly equipped with noise control devices, construction-generated source noise could result in annoyance and/or sleep disruption to occupants of the nearby existing noise-sensitive land uses (e.g., rural residences, Migrant Headstart) and create a substantial temporary increase in ambient noise levels in the project vicinity. As a result, this impact is considered potentially significant. Implementation of Mitigation Measures Noise-1 through Noise-4 would reduce short-term construction source noise to a less-than-significant level.

Mitigation Measure Noise-1: Maintain and Equip Construction Equipment with Noise Control Devices.

Construction equipment shall be properly maintained and equipped with all feasible noise control, such as mufflers, in accordance with manufacturers' specifications.

Mitigation Measure Noise-2: Limit Construction to the Hours of 7:00 a.m. to 6:00 p.m.

Construction activities shall be limited to the hours of 7:00 a.m. to 6:00 p.m. Monday thru Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays, during which times such noise levels from activities are typically exempt. No activities are permitted on Sundays or federal holidays.

Mitigation Measure Noise-3: Arrange Construction Equipment Travel to Minimize Disturbance to Occupied Residences and Limit Idling Times.

Construction equipment travel shall be arranged to minimize disturbance to occupied residences and shall remain in staging areas when not in use. Equipment not in use shall not be left idling for more than 15 minutes.

Mitigation Measure Noise-4: Designate a Disturbance Coordinator to Receive All Public Complaints.

A disturbance coordinator shall be designated and the person's telephone number shall be conspicuously posted around the project site and supplied to nearby sensitive receptors. The disturbance coordinator shall receive all public complaints and be responsible for determining the cause of the complaint and implementing any feasible measures to alleviate the problem.

Implementation of the above mitigation measures would reduce construction-generated noise levels by 15 dB to 25 dB at noise-sensitive receptors in the project vicinity. Furthermore, restriction of operation of construction-related equipment during less-sensitive daytime hours would reduce sleep disturbance and human annoyance. As a result, short-term construction-generated noise levels would be reduced to a less-than-significant impact after mitigation.

LONG-TERM OPERATIONAL SOURCE NOISE

Less-than-Significant Impact. Long-term operation of the project would not include any new major stationary noise sources. No new maintenance activities beyond existing conditions would be created, and existing maintenance operations would continue with the new levees. Thus, long-term stationary source noise levels would be equal to existing conditions. In addition, the long-term operation of the project would not create increases in vehicle traffic on the local roadway system (see "Traffic/Transportation" section). Noticeable increases of 3 dBA (CNEL/L_{dn}) do not typically occur without a substantial (i.e., doubling) increase in roadway traffic volumes. Consequently, the operation of the project would not noticeably change traffic noise contours of area roadways. Thus, long-term operational stationary and vehicle source noise would not expose persons to or generate of noise levels in excess of applicable standards in the project vicinity. As a result, this impact is considered less than significant.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant with Mitigation. Construction activities have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. Table 3-6 displays vibration levels for typical construction equipment.

Table 3-6
Typical Construction-Equipment Vibration Levels

Equipment		PPV at 25 feet (in/sec)[1]	Approximate L_v at 25 feet[2]
Pile Driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile Driver (sonic)	Upper range	0.734	105
	Typical	0.170	93
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

[1] Where PPV is the peak particle velocity

[2] Where L_v is the velocity level in decibels (VdB) referenced to 1 microinch/second and based on the root mean square (RMS) velocity amplitude.

Source: FTA 2006

As discussed above, on-site construction equipment would include graders, dozers, and excavators. According to the Federal Transit Administration (FTA), vibration levels associated with the use of bulldozers range from approximately 0.003 to 0.089 inches per second (in/sec) peak particle velocity (PPV) and 58 to 87 vibration decibels Lv (VdB referenced to 1 microinch per second [µin/sec] and based on the root mean square [RMS] velocity amplitude) at 25 feet, as shown in Table 3-6. Using FTA's recommended procedure for applying a propagation adjustment to these reference levels, predicted worst-case vibration levels of approximately 0.01 in/sec PPV and 69 VdB at the nearest rural sensitive residence (100 feet) could occur from use of large bulldozers. These vibration levels would not exceed DOT recommended standard of 0.2 in/sec PPV (DOT 2002) with respect

prevention of structural damage for normal buildings or the FTA's maximum-acceptable vibration standard of 80 VdB (FTA 2006) with respect to human annoyance for residential uses.

However, predicted worst-case vibration levels of approximately 0.35 in/sec PPV at the nearest structure (10 feet) could occur from the use of large bulldozers. These vibration levels would exceed DOT recommended standard of 0.2 in/sec PPV (DOT 2002) with respect to the prevention of structural damage for normal buildings. Thus, the use of large bulldozers within 10-feet of structures during short-term construction could potentially create structural damage from excessive groundborne vibration or groundborne noise levels. A farm shed is located within 15-feet of proposed short-term construction (behind proposed retaining wall at LM 4.2L). It is unlikely due to the silty nature of the soil around the large farm shed that any structural damage would occur. However, a definitive answer to whether structural damage would occur cannot be made. Implementation of Mitigation Measure Noise-5 would reduce any potential effects to structural integrity as a result of short-term construction source vibration to a less-than-significant level.

The long-term operations and maintenance of the project would not include any vibration sources; consequently there would be no impact from long-term operations and maintenance.

Mitigation Measure Noise-5: Pre- and Post- Construction Photographic Survey and Report of Any Structures That Are Within 15 Feet Of Heavy Equipment Operation and Compensation for any Construction-incurred Damage

DWR shall provide a pre- and post- photographic survey and report of any structures that are within 15 feet of heavy equipment operation. If damages to the structure occur, DWR shall compensate the owner for damages.

With implementation of Mitigation Measures Noise-5, potential short-term construction-generated vibration impacts would be reduced to a less-than-significant impact.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less-than-Significant Impact. As discussed in a) above, long-term operation of the project would not include any new major stationary noise sources. No new maintenance activities beyond existing conditions would be created, and existing maintenance operations would continue with the new levees. Thus, long-term stationary source noise levels would be equal to existing conditions. In addition, the long-term operation of the project would not create increases in vehicle traffic on the local roadway system (see "Traffic/Transportation" section). Noticeable increases of 3 dBA (CNEL/L_{dn}) do not typically occur without a substantial (i.e., doubling) increase in roadway traffic volumes. Consequently, the operation of the project would not noticeably change traffic noise contours of area roadways. Thus, long-term operational stationary and vehicle source noise would not create a substantial permanent increase in ambient noise levels in the project vicinity. As a result, this impact is considered less than significant.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant with Mitigation. As discussed in a) above, Yolo County has not adopted a noise ordinance or any other construction noise standards for which construction-generated noise levels would exceed. Nevertheless, if construction activities were to occur during the more noise-sensitive hours (e.g., evening, nighttime, and early morning) or construction equipment was not properly equipped with noise control devices, construction-generated source noise could result in annoyance and/or sleep disruption to occupants of the nearby existing noise-sensitive land uses (e.g., rural residences, Migrant Headstart) and create a substantial temporary increase in ambient noise levels in the project vicinity. As a result, this impact is considered potentially significant. Implementation of Mitigation Measures Noise-1 through Noise-4 would reduce short-term construction source noise to a less-than-significant level.

e, f) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and for a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The project area is not located within 2 miles of an airport land use plan or a public airport, or in the vicinity of a private airport. Sunrise Dusters, the closest private airport, is located approximately 7 miles north of the project site. The nearest public airport is the Watts-Woodland located approximately 6 miles southwest of the project site. Given the distance from these airports and that the project does not include the development of any noise-sensitive receptors, the project would not expose people residing or working on the project site to excessive noise levels. The project would have no impact from aircraft source noise.

POPULATION AND HOUSING

THRESHOLDS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. Population and Housing. Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing homes, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

This analysis documents the existing population and housing condition in Yolo County and the town of Yolo. It presents estimates of changes to those conditions that could be created with implementation of the proposed project, or changes that could trigger adverse physical effects in the region.

ENVIRONMENTAL SETTING

POPULATION

The project site is located in Yolo County, near the town of Yolo. The site is primarily rural and sparsely populated. Yolo County (County) has grown moderately in recent years, from 141,092 in 1990 to 168,660 in 2000. Population projections for the county by the Sacramento Area Council of Governments (SACOG) are 236,110 in 2020 and 266,000 by 2025 (SACOG 2001). The gain in new residents would be approximately 97,300 by 2025, or a little over 37%. Based on county land use policies and zoning and Local Agency Formation Commission policies, it is evident that most of that population increase would occur in the cities, with limited growth in the unincorporated communities. The population of the town of Yolo as of 1997 was 457.

HOUSING

According to information provided by SACOG, only 21 housing units were constructed in the Yolo County unincorporated area in 1999, compared to a total of 1,301 in the incorporated cities. However, approximately 450 parcels in the unincorporated area of Yolo County have been tentatively approved for development of single-family homes (Yolo County 2002a, 2005). There were an estimated 161 housing units in the town of Yolo according to 1997 data (Yolo County 2005).

Discussion

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The proposed project would not involve the construction of new homes or businesses or the extension of roads or infrastructure. Construction would only occur on undeveloped and agricultural land. Construction of the proposed setback levee would not increase flood protection to a level that would allow additional growth. The proposed project would benefit the community as a whole by reducing the level of flood risk. Implementation of the proposed project would have no effect on current and/or planned population growth patterns within Yolo County and would not affect the population goals as outlined in the County General Plan. Therefore, the proposed project would have a no impact on population growth in the area, either directly or indirectly.

b) Displace substantial numbers of existing homes, necessitating the construction of replacement housing elsewhere?

No Impact. Because the construction of the setback levee and road relocation would not go through any existing development, it would not displace any existing housing or disrupt or divide an established community. Therefore, the proposed project would have no impact on housing.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. Because the construction of the setback levee and road relocation would not go through any existing development, it would not displace people. The Proposed project would benefit the project vicinity and the community as a whole by reducing the level of flood risk. Therefore, the proposed project would have a no impact on population.

PUBLIC SERVICES

THRESHOLDS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. Public Services. Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

This section provides an overview of existing public services in the project area, including fire protection, police service, and school facilities. Impacts are evaluated in relation to increased demand for public services associated with the proposed project.

ENVIRONMENTAL SETTING

FIRE PROTECTION

The only independent fire suppression district in the county, the Yolo Fire Protection District (FPD), is located in northeastern Yolo County. Yolo FPD is bordered by Knights Landing FPD to the northeast; Zamora FPD to the northwest; Madison FPD to the west; and Willow Oak, Woodland Springlake, and Elkhorn FPDs to the south. These neighboring FPDs have equipment and staff available to the Yolo FPD should the need arise. Yolo is the only town within the FPD and consists mostly of residential development (Yolo County Local Agency Formation Commission 2005).

The Yolo FPD staff consists of a volunteer fire chief and 23 volunteer firefighters. One of the volunteers is a certified emergency medical technician, and the remaining volunteers are certified to administer CPR and first aid. The district's major equipment is composed of four engines/fire trucks, one tender, and one rescue squad truck (LAFCO 2005).

POLICE SERVICES

The Yolo County Sheriffs Department (YCSD) provides law enforcement services to unincorporated areas of Yolo County. YCSD has a staff of approximately 227 personnel (85 sworn and 142 civilian); the staff serves a total area of 1,035 square miles in Yolo County. YCSD contains the following units: three K-9 units, two Capay augmented patrol deputies, one sergeant and two officers for problem-oriented policing, 13 officers on 24-hour